Food Handler's Manual

A Guide to Safe & Healthy Food Handling for Food Establishments

BOULDER COUNTY
PUBLIC HEALTH
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Importance of Proper Food Handling

Causes of Foodborne Illness

According to the Centers for Disease Control and Prevention (CDC), 1 in 6 people (48 million people) get sick, 128,000 are hospitalized, and 3,000 people die from a foodborne illnesses each year in the U.S.. Foodborne illnesses cost the U.S. economy about $8.1 billion every year. Boulder County Public Health (BCPH) regularly receives and investigates reports of foodborne illnesses in our community. Viruses and bacteria account for 98% of all foodborne illness (viruses 80%; bacteria 18%), both of which can be controlled through proper food handling.

Viruses

Common viruses that may cause foodborne illness include hepatitis A and norovirus. These viruses are most often passed from stool to mouth (fecal-oral route), which makes thorough handwashing and avoiding bare hand contact with ready-to-eat food extremely important.

Bacteria

Bacteria can grow in food if the food is not handled properly. Bacteria grow quickly, and under optimal conditions, they double every 20 to 30 minutes. The way bacteria grow in potentially hazardous foods makes temperature controls and food safety practices extremely important.
Common bacteria that may cause foodborne illness include:

- Salmonella
- Escherichia coli (E. coli) O157:H7
- Shigella
- Staphylococcus aureus (staph)
- Bacillus cereus
- Clostridium perfringens
- Clostridium botulinum
- Campylobacter jejuni
- Listeria

Potentially Hazardous Foods

“Potentially hazardous food” is any food or food ingredient that is capable of supporting the rapid and progressive growth of infectious or toxigenic microorganisms. To be potentially hazardous, a food must be:

- Moist
- Non-acidic (neutral pH)
- A food source for bacteria

Some potentially hazardous foods include:

- All meats
- Dairy products
- Eggs
- Cooked vegetables
- Tofu, tempeh, soy milk
- Cooked beans, pastas, grains
- Raw seed sprouts (alfalfa sprouts, bean sprouts, etc.)
- Garlic, onion, or herbs in oil
- Cut melon and cut tomato

Special Considerations

Highly Susceptible Populations

Anyone can get sick from food when it is handled in an unsafe manner; however, certain people get sick more often or have more serious illness. Highly susceptible populations include:

- Children younger than 5 years
- Adults older than 65 years
- Pregnant women
- People with compromised immune systems (due to cancer, AIDS, diabetes, or other medical conditions)

Certain foods are more likely to cause foodborne illness. People in highly susceptible populations should be aware of these foods:

- Undercooked meats
- Raw oysters
- Undercooked eggs
- Sprouts
- Unpasteurized milk or juices (this includes “raw milk”)

Additional restrictions apply to food prepared in facilities that primarily serve highly susceptible populations. See Section 3-602 in the Colorado Retail Food Establishment Rules and Regulations for more information.

Food Allergies

Each year, millions of people in the U.S. have allergic reactions to certain foods. Food retailers are responsible for knowing the ingredients in the foods served. The eight most common allergy-causing foods include:

- Milk
- Eggs
- Fish (e.g. bass, flounder, cod)
- Crustacean shellfish (e.g. crab, lobster, shrimp)
- Tree nuts (e.g. almonds, walnuts, pecans)
- Peanuts
- Wheat
- Soybeans

Facilities must know the ingredients in the foods served

Employee Illness and Hygiene

Sick employees must be restricted or excluded from working with food

Sick Employees

Sick employees are at high risk for contaminating food and utensils with bacteria or viruses. For this reason, sick employees must be restricted or excluded from working with any food or food service equipment.

Employees must be restricted or excluded if demonstrating any of the following symptoms:

- Diarrhea
- Vomiting
- Fever
- Jaundice
- Sore throat with fever
- Infected cuts/lesions on hands, wrists
- Persistent coughing, sneezing, runny nose

Any employees diagnosed with the following illnesses must report these illnesses to their supervisor:

- Salmonella typhi
- Shigella spp.
- Escherichia coli (E. coli)
- Hepatitis A

The person in charge must **immediately** report these illnesses to Boulder County Public Health at 303.441.1564.

Rub hands vigorously with soap and warm water for 15 seconds

Food Worker Policies

All employees must maintain good hygienic practices, including:

- Eating food and smoking in designated areas only.
- Storing drinks in clean, closed containers that do not contaminate hands (e.g. cups with lids and straws or handles).
- Storing drinks below and separate from food, prep surfaces, utensils, etc.
- Wearing hair restraints and clean outer clothing.
- Keeping fingernails trimmed and clean.
- Removing all jewelry from hands and wrists, only a single ring is permitted.
- Removing aprons before entering the restroom or leaving the food prep area.
- Not using cloth towels or aprons for wiping hands.

Handwashing and Glove Use

Proper handwashing is the single most effective way to stop the spread of disease. Always thoroughly wash hands:

- When entering the kitchen.
- When returning from the restroom.
- After handling raw meat, poultry, fish, or eggs.
- After touching face or sneezing/coughing into hands.
- After handling dirty dishes.
- Before putting on new gloves.
- Anytime hands may be contaminated

Proper handwashing method

- Rub hands vigorously with soap and warm water for 15 seconds.
- Rinse well for 5 seconds.
- Dry thoroughly with paper towel.
- Turn off faucet handles using a paper towel.

Handwashing sinks

Handwashing sinks must be used for handwashing ONLY and must have:

- Hot AND cold running water
- Soap
- Paper towels

Do not block handwashing sinks or use these sinks for any other purpose (dumping liquids, rinsing containers, filling sanitizer buckets, filling water pitchers, etc.).

Handwashing sinks must be used for handwashing only

Glove use

When using gloves, always wash your hands before putting on a new pair of gloves. Change your gloves and wash your hands whenever the gloves become contaminated, including:

- After handling raw meat, poultry, fish, or eggs.
- After touching face with glove or sneezing/coughing into the glove.
- After touching unclean dishes or trash cans.
- When changing tasks.

Gloves must be worn over any bandages, cuts, burns, or sores. They should be considered an extension of your hands and are **NOT** a substitute for good hand-washing practices.

Gloves must be worn over bandages, cuts, burns, and sores

Bare Hand Contact and Ready-to-Eat Foods

Do not touch ready-to-eat foods with bare hands. Avoid bare hand contact by using single-use gloves, utensils, deli tissue, etc.

Ready-to-eat foods are foods that do not require further cooking or heating before being served. These foods are most at risk for transmitting fecal-oral diseases (e.g. E.coli, hepatitis A and norovirus) that are transmitted from contaminated hands.

Some ready-to-eat foods include:

- Food and drink garnishes
- Salads
- Fresh fruits and vegetables
- Pizza
- Sandwiches
- Cheese
- Sushi
- Beverages, ice
- Cookies and pastries

Do not handle ready-to-eat foods with bare hands

Starting with Safe Food

Food Quality and Food Storage

USDA raw meat inspection stamp

USDA raw poultry inspection stamp

Ensure that food comes from approved sources

All food in food service establishments must be obtained from an approved source. Always verify the supplier's documentation to ensure that the supplier is an approved wholesale distributor.

Meats	Verify that all meats and poultry have the United States Department of Agriculture (USDA) stamp of approval on the packaging.
Sushi	Ask for a letter from your fish supplier verifying that required freezing techniques have been performed on any fish intended to be used for sushi, considered to be sushi-quality, or served raw.
Shellfish	Verify that shellfish have complete, attached tags showing that they came from approved harvest sites. Retain shellfish tags for a minimum of 90 days. Discard any shellfish whose shells do not close.
Raw Eggs	Do not use raw eggs in any ready-to-eat food items (e.g. caesar salad dressing, hollandaise, meringue) unless the eggs are pasteurized. Eggs must come from a supplier inspected by the U.S. Food and Drug Administration or the Colorado Department of Agriculture.

Check cans for dents or leaks upon delivery

Ensure that all food is wholesome and free of spoilage

- Check cans for dents or leaks upon delivery.
- Check food temperatures and food quality upon delivery:
  - Reject questionable items.
  - Cold food must be 41ºF or below when delivered.
- Do not use moldy or spoiled foods. Discard them immediately.
- Observe and do not alter or cover "sell-by" or "use-by" dates in any way.

Store food in a protected manner

- At least 6" above the floor
- Covered and labeled in dry storage areas
- Away from chemicals, wastewater lines, or any other possible source of contamination

Wash fruits and vegetables thoroughly

Washing Fruits & Vegetables

Increasing numbers of foodborne illness outbreaks have been occurring in recent years due to contaminated produce. ALL produce should be washed thoroughly:

- In a prep sink that has been washed, rinsed, and sanitized before use.
- Using a colander and cold running water.
- Before cutting or preparing (including lemons, melons, avocados, mushrooms, cabbage, lettuce, squash, etc.).

Preventing Cross-Contamination

Cross-contamination is when bacteria or viruses are spread from a contaminated source (raw chicken, meats, fish, eggs; soiled utensils and equipment, etc.) to another food or surface.

Prevent cross-contamination when storing foods

Preventing cross-contamination

- Store raw meats, poultry, fish, and eggs:
  - On the bottom shelf of the refrigerator.
  - Below and separate from all other foods.
- Use a drip pan under raw meat, poultry, fish, or egg products.
- Change gloves and wash hands after handing any raw meat, poultry, fish, or eggs.
- Wash, rinse, and sanitize all food contact work surfaces, including cutting boards, sinks, prep tables, slicers, utensils:
  - At least every four hours during continued use.
  - After working with raw meat products and before preparing any other foods.
- Tip: Use separate cutting boards and utensils for raw meat and for produce and ready-to-eat food.

Time and Temperature Controls

The "danger zone" is between 41ºF and 135ºF

The Danger Zone

Proper temperature controls and food handling practices prevent growth of bacteria. The **"danger zone"** is the temperature range between **41ºF and 135ºF**. Bacteria grow very rapidly in the danger zone. Therefore, proper cooling, reheating, cold holding, hot holding, and cooking temperatures should be carefully monitored.

Holding Temperatures

Potentially hazardous foods need to be kept out of the danger zone as much as possible. When food is being held in refrigerators, cold tops, salad bars, hot hold equipment, and during transport, potentially hazardous food must be held at 41ºF or below or at 135ºF or above. After foods are properly cooked, reheated, or cooled, they need to be kept at the proper holding temperatures.

TEMPERATURE	KEEP FOOD AT	INCLUDING
Cold	41ºF or below	• refrigeration • cold top units • salad bar • transport
Hot	135ºF or above	• steam tables • stovetops • heating cabinets • transport

Maintain cold food at 41°F or below at all times

Temperature Logs

Use temperature charts or logs to record and verify proper temperature.

- Check and record temperatures every two hours.
- Monitor food temperatures and food equipment thermometer readings.
- Be sure to record corrective actions taken.

Maintain hot food at 135ºF or above at all times

Thermometers

Every food service establishment should use metal-stem thermometers for monitoring food temperatures and refrigerator thermometers for monitoring the temperature inside refrigeration units. Both types of thermometers must be accurate and calibrated regularly.

When taking temperatures, remember:

- Clean and sanitize thermometers before use.
- Take the temperature in several places, particularly irregularly shaped items.
- Stir food before taking temperature.
- Place stem or probe in the thickest part of the food item.
- Do not rest the stem or probe on a bone or the side of the pot, pan, etc. because this may give an inaccurate reading.
- Make sure the entire sensing area of the thermometer is completely submerged in the food.

Calibrating Thermometers

Daily thermometer calibration is recommended. Thermometers should also be recalibrated if dropped or subjected to extreme temperatures.

Thermometers should be calibrated daily

Check metal-stem thermometers for accuracy

1. Place thermometer stem in a glass filled with ice and a little water.
2. Wait 15-20 seconds; if the thermometer does not read 32ºF, it needs to be calibrated.

Calibrating thermometers

To adjust an inaccurate DIAL thermometer, use pliers or a wrench (some thermometer sleeves have one built in) to adjust the nut on the underside of the thermometer face until it reads 32ºF in ice water.

Some inaccurate DIGITAL thermometers can be field-calibrated, see thermometer instructions for details. Other inaccurate digital thermometers may have to be adjusted by the manufacturer, or they may have to be replaced.

Preparing Food Safely

Check temperature in the thickest part of the food

Thawing Foods

Frozen foods must be thawed using methods that maintain temperature control. Approved methods for thawing include:

- Refrigeration (move large items to refrigerator 2-3 days before needed)
- Under cold running water that completely covers the food
- Microwave (if used immediately)
- Conventional cooking (e.g. hamburger patties, french fries)

Cooking Temperatures

When cooking meats or egg products, the food must be cooked to the required internal temperature, as listed below. To ensure that the proper internal cooking temperature is met, use a probe thermometer to check the temperature in the thickest part of the food.

MEAT	TEMPERATURE
Poultry and stuffing	165ºF
Ground beef	155ºF
Fish, shellfish, eggs, pork, and 'other' meats	145ºF
Rare beef steak or beef roast	130ºF

Reheating Foods

Stovetop is an approved method of reheating. Do NOT reheat foods on steam tables or other hot-holding equipment

After cooling, all leftovers and pre-made foods must be reheated to an internal minimum temperature of **165ºF** within a **two hour time period**.

Approved methods of reheating include:

- Stovetop
- Oven
- Microwave
- Other rapid-heating equipment

NOTE: Most hot hold equipment is not designed to reheat foods. When using a microwave to reheat, cover the food, stir, and wait two minutes before checking temperature and serving.

Cooling Potentially Hazardous Food

Potentially hazardous foods must be cooled as quickly as possible to prevent the growth of bacteria as the food drops through the danger zone.

Hot Foods: must be cooled from **135°F to 70°F in 2 hours or less** and then from **70°F to 41°F in 4 hours or less**. If foods do not reach the 70°F mark within 2 hours, foods must be thrown out or reheated to 165°F and then cooled again.

Room-Temperature Foods: (e.g. tuna salad, cut melon, sliced deli meats) must be cooled from **70°F to 41°F in 4 hours or less**.

Cool in shallow pans in walk-in cooler

Cooling methods

How quickly food cools depends on a number of factors, including:

- Thickness or density of the food
- Storage container

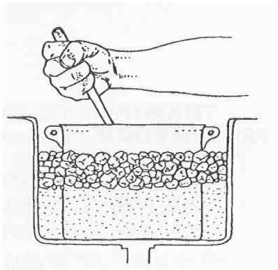
Before cooling foods, reduce the size of the food by cutting into smaller pieces. Divide large containers of food into smaller containers or shallow pans. Shallow metal pans about 2”-4” deep work best. To rapidly cool food, use any of the following methods or combine methods.

Refrigerator or Freezer

Place small containers of food into a refrigerator or freezer. Space the containers to allow airflow around the containers. Leave the food uncovered until it reaches 41°F.

Ice Bath

Divide food into smaller containers and then place them into a clean prep sink or larger container filled with ice water. Make sure the ice water and the food are at the same level. Stir regularly. Use baths along with refrigeration.



Fill ice and water to the level of food

Ice Paddle

Paddles are best for soups, gravies, and other thin foods. Stir regularly. Use ice paddles along with the refrigeration or ice bath method.

Blast Chiller

Blast chillers move cold air across food at high speeds to help remove heat.

Add Ice/Cold Water

Add ice or cold water to the fully cooked product to help the cooling process. This works well for soups, stews, or recipes that have water as an ingredient.

Cleaning and Sanitizing

Cleaning is the removal of dirt, soil, and debris; sanitizing is the removal of disease-causing microorganisms.

Washing Food Contact Surfaces

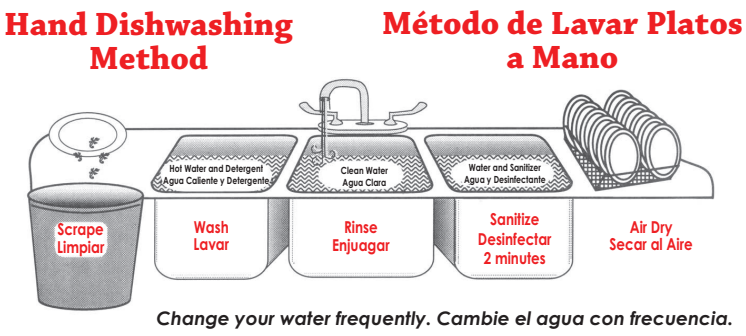
ALWAYS prepare fresh hot, soapy water; rinse water; and sanitizer solution after cleaning equipment used for raw meat

ALL food service equipment, including utensils, prep tables, sinks, cutting boards, slicers, mixers, and anything else used to prepare food, must be **washed, rinsed, and then sanitized:**

- At least every four hours during continued use.
- After preparing raw meat, poultry, fish, and eggs.

Clean solutions of hot, soapy water; rinse water; and sanitizer solution must be prepared regularly and always after cleaning any utensils, cutting boards, etc. used for raw meat preparation.

Whether washing dishes in a three-compartment sink or in a mechanical dishwasher, the same steps must be followed:



Scrape – Wash – Rinse – Sanitize – Air Dry

Sanitizers

Sanitizers are used to reduce the number of pathogens that may be found on food service equipment. Chemical sanitizers and hot water sanitization are both approved methods for sanitizing equipment.

- A minimum of 60 seconds contact time is required with chemical sanitizers.
- Test strips must be used to check for proper sanitizer concentrations.
- For hot water sanitizing, the surface of the dish must reach 160°F.

Approved concentrations of sanitizers include:

- Chlorine (bleach): 50-200 ppm
- Quaternary ammonium: 200 ppm (unless otherwise specified by the manufacturer)
- Iodine: 12.5-25 ppm

Storing Utensils and Chemicals

Clean and sanitized utensils should be stored in a way that keeps them clean. Store them at least 6” off the floor and so they are protected from contamination.

Proper in-use utensil storage

In-use utensils may be stored:

- In the food, with the handle up and out of the food.
- On a clean, dry surface that is cleaned and sanitized every four hours.
- In water 135°F or more or 41°F or below.
- In running water (ice cream scoops only).

NEVER store in-use utensils in sanitizer or in room-temperature water.

Storing chemicals

Chemical contamination of food may cause serious injury to the consumer.
Ensure that all chemicals are stored:

- Below and separate from food and food contact surfaces (e.g. prep areas and utensils).
- In a designated chemical storage area.
- In correctly labeled containers.

Store chemicals separately

Do not:

- Use chemical bottles for food storage (oil, water, etc.) or food containers for chemical storage.
- Mix chemicals or re-use containers for different chemicals.

NOTE: Only chemicals approved for retail food establishment operations are permitted on the premises. All chemicals must be used according to the manufacturer’s specifications.

Wiping cloths

In-use wiping cloths should be stored in clean sanitizer solution between uses.

Separate buckets of sanitizer must be provided for wiping off:

- Raw meat prep areas
- Non-food contact areas (e.g. counters, dining tables)
- Food contact areas (e.g. cutting boards, prep tables, etc.)

Separate wiping buckets

Wiping a surface with a sanitized cloth is NOT the same as cleaning and sanitizing!
Wiping cloths are to be used to clean up spills and food debris only.

Equipment and Facility Maintenance

Approved Equipment

Equipment must be approved for use in a retail food establishment

All food service utensils and equipment must be approved for use within a retail food establishment:

- Use only utensils and equipment constructed of food-grade materials (e.g. spray bottles, containers, cookware).
- Do not re-use single-use items (e.g. plastic milk jugs or other food containers).
- Mixers, blenders, food processors, refrigeration, etc. must be approved by the National Sanitation Foundation (NSF) or other American National Standards Institute (ANSI)-accredited certification program (domestic appliances cannot be used).
- Only use food-grade lubricants in equipment.

Equipment Cleaning and Maintenance

Maintain regular cleaning schedules for equipment

Food service equipment operates best when it is maintained in good condition and kept clean. The build-up of food debris and grease on equipment and in the food service establishment may attract pests and otherwise create unsanitary conditions. Regular cleaning schedules should be maintained for:

- Ice machines
- Refrigeration interiors and exteriors (including shelves, compressor coils, fan covers, door gaskets)
- Fryers
- Grill equipment
- Ovens
- Hoods
- Steamers
- Beverage machines (soda nozzles, ice chutes)
- All other kitchen equipment

Pests

NEVER apply household pesticides

Control pests in the food service establishment by:

- Using a professional exterminator.
- Using approved traps.
- Tightly sealing openings, using screen doors, and using fly fans.
- Keeping equipment and the interior and exterior of the facility clean .

NEVER apply household pesticides in a food service establishment.

General Facility Maintenance

Food service establishments must be kept in good sanitary condition, both inside and outside of the facility.

Floors, Walls & Ceilings	Floors, walls, and ceilings should be maintained clean and in good repair.
Lighting	Lighting should be maintained and should provide the following levels of light: • 50 foot-candles of covered or otherwise shatter-resistant light above food preparation and dishwashing areas • 20 foot-candles at utensil storage areas and in toilet and lavatory areas • 10 foot-candles in other areas, including dry storage areas
Restrooms	Restrooms should be kept clean and stocked with toilet paper, soap, and paper towels or approved hand-drying devices.
Clean Linens	• Clean linens must be stored in a clean, dry area and protected from contamination (i.e. away from chemicals, wastewater lines, etc.). • Laundry facilities (washer and dryer) must be kept clean and located separately from food preparation areas.
Backflow	Any water fixture that has a threaded faucet must have an approved backflow prevention device.
Plumbing	Plumbing must be kept in good condition and free of leaks, duct tape, plastic wrap, or other unapproved repair materials.
Mop Sinks	Mop sinks must be used for disposal of mop water and chemicals. These sinks may not be used for any other purpose (i.e. dishwashing, food preparation, handwashing). They must be kept clean and in good condition.
Waste	Garbage and refuse containers should be kept clean and inaccessible to rodents, insects, and other vermin.
Sewage	All sewage systems must be properly operating. Sewage backups create an imminent health hazard and must be **immediately** remedied: • Contact a licensed plumber. • Close the kitchen or the area where the backup occurred until it is repaired.
Grease	Grease must be disposed in an approved bin or grease trap that is regularly serviced and kept clean. Cleaning of equipment and pumping grease traps must be done in an approved manner that does NOT contaminate the outside area or run to storm drains.
Ventilation	Hood systems and other ventilation should be kept clean and balanced for proper air flow.

Emergencies

In the event of a flood, fire, power outage, sewage backup, water shortage, or other emergency, potential health hazards may exist. Never enter a building damaged by flood, sewage or fire until it has been cleared by the proper authorities.

Establishments that are required to cease operations during an emergency or those affected by a natural disaster should not reopen until it is deemed safe to do so by Boulder County Public Health.

Discard all food that may have been contamniated by smoke or chemicals from a fire

Fire

If a large fire occurs in the facility, cease all operations until the facility has been cleared by Boulder County Public Health. If there is a substantial fire, the facility may need to submit a plan review and/or apply for building permits. If a small fire occurs (e.g. under the hood), follow these instructions:

- Discard all exposed food and single-service products that may have been contaminated by water, smoke, chemicals, or other contaminants.
- Discard all potentially hazardous foods that have been stored in the danger zone (41°F - 135°F) for four hours or more.
- Wash-rinse-sanitize all equipment and surfaces that have been contaminated.
- Ensure that electricity and water services are fully operational.

Water Shortage or Power Outage

If the facility experiences a sudden water or power shortage due to a disaster or other reason, **immediately cease all food service operations** and call Boulder County Public Health at 303.441.1564.

Food establishment operations must have running water and electricity at all times for proper handwashing, cleaning, food preparation, etc. Any potentially hazardous foods held in the danger zone (between 41ºF and 135ºF) for more than four hours must be discarded. This includes items in walk-in refrigerators and freezers.

Discard all food that have been submerged in floodwaters or sewage

Flood or Sewer Backup

If a flood, sewer backup, or similar incident occurs in your facility, immediately call Boulder County Public Health at 303.441.1564. Many harmful microorganisms and chemical residues may exist in floodwater and sewage.

After the proper authorities have cleared the facility for you to return, follow these steps to ensure that food service operations may resume without compromising food safety:

- Discard all food, single-service items, and packaging materials that have been contaminated by floodwaters or sewage.
- Discard all refrigerated and frozen foods if electricity was turned off during or after the incident for more than four hours.
- Thoroughly wash, rinse, and sanitize **ALL** surfaces, utensils, and equipment.
- Ensure that all refrigeration units are capable of maintaining temperatures of 41ºF or below and that all facility equipment is functioning properly.

Additional Tips and Information

Self-Inspection

Self-inspections are a great tool for managers and staff to make sure their facility is following good practices. Self-inspections also help facilities prepare for regular inspections by Boulder County Public Health. For more information and a sample self-inspection form, visit www.BoulderCountyFood.org.

To conduct a self-inspection, you will need:

- A self-inspection form, clipboard, and pen
- A calibrated metal-stem thermometer
- Test strips for sanitizer
- A flashlight (for better viewing of dark corners, equipment interiors, etc.)

Food Handler Training

In addition to this manual, Boulder County Public Health offers food safety classes (Sanitation Training Assistance for Restaurateurs, or STAR) and various other resources. To learn more about these educational opportunities, visit our website at www.BoulderCountyFood.org or contact us at 303.441.1564.

The information provided in this manual is based on the Colorado Retail Food Establishment Rules and Regulations, but it does not represent all requirements of established regulations. To download a copy of the Colorado Retail Food Establishment Rules and Regulations, visit our website at www.BoulderCountyFood.org, or contact us at 303.441.1564.

References and Additional Resources

1. The Centers for Disease Control and Prevention (CDC)
   www.cdc.gov

2. U.S. Food and Drug Administration (FDA)
   www.fda.gov

3. U.S. Department of Agriculture (USDA)
   www.usda.gov

4. Food Safety Gateway
   www.foodsafety.gov

5. Colorado Department of Public Health and Environment
   www.cdphe.state.co.us